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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/575,237	05/22/2000	Hiroyuki Akashi	P00,0483	1992

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SONNENSCHN NATH & ROSENTHAL
P.O. BOX 061080
WACKER DRIVE STATION
CHICAGO, IL 60606-1080

EXAMINER

CHANEY, CAROL DIANE

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 07/01/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/575,237

Applicant(s)

AKASHI ET AL.

Examiner

Carol Chaney

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 April 2003.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-38 is/are pending in the application.
- 4a) Of the above claim(s) 11-38 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other:

Claim Rejections - 35 USC § 103

Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pendalwar et al., US Patent 5,716,421 with evidence shown by Spotnitz et al., UP Patent 6,322,923 for reasons of record. For convenience, the rejection is repeated below.

Pendalwar et al. disclose a battery which includes a lithium intercalation material cathode (14), a carbon anode (12) and an electrolyte system (26). (Note column 3, lines 24-40 and 51-64.)

The electrolyte system includes an inert phase (28) and absorbing phases (30, 32). The inert phase may include a plurality of porous polymeric layers, formed from polyalkenes such as polyethylene, polypropylene, or other polymers such as polytetrafluoroethylene, polyethyleneterephthalate, polystyrene, ethylene propylene diene monomer, nylon, and combinations thereof. In one preferred embodiment, layer 54 is fabricated of polyethylene, while layers 56 and 58 are fabricated of polypropylene. (Note column 4, lines 33-41.) The layers 70 and 72 are absorbing or gel forming polymers. The absorbing or gel-forming polymer may be selected from the group of polymers including polyvinylidene fluoride (PVDF), polyurethane, polyethylene oxide, polyacrylonitrile, polymethylacrylate, polyacrylamide, polyvinylacetate, polyvinylpyrrolidone, polytetraethylene glycol diacrylate, copolymers of any of the foregoing, and combinations thereof. Because polyvinylidene fluoride/hexafluoropolypropylene copolymers are commercially available materials, marketed as Hylar, KF, Kynar and Kynar Flex polymers, one of ordinary skill in the art

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would recognize the above-mentioned listing to encompass polyvinylidene fluoride/hexafluoropolypropylene copolymers.

The solvent used with the gel forming polymer may be, but is not limited to, propylene carbonate (PC), ethylene carbonate (EC), diethyl carbonate (DEC), dimethyl carbonate (DMC), dipropylcarbonate dimethylsulfoxide, acetonitrile, dimethoxyethane, tetrahydrofuran, n-methyl-2-pyrrolidone (NMP), acetone and combinations thereof.

When the battery system taught by Pendalwar et al. is heated above a threshold temperature, (135 °C for polyethylene) one or more of the polymer support structure layers (54, 56, 58 of Fig. 2) will melt, thereby cutting off ionic conductivity in the battery. The battery impedance is higher at 135 °C than it is at room temperature. (Note Figure 5.)

The disclosure of Pendalwar et al. differs from applicants' invention in that Pendalwar et al. do not recite specific thicknesses or porosities of porous separator layers. However, one of ordinary skill in the art would recognize separator thicknesses between 5 and 15 microns and porosities between 25 and 60% to be conventional in the art, as evidenced by Spotnitz et al., US Patent 6,322,923, column 2, lines 26-52. Thus, applicants' invention as a whole would have been obvious to one of ordinary skill in the art.

Response to Arguments

Applicant's arguments filed 21 April 2003 have been fully considered but they are not persuasive.

Applicant notes that the significant feature of the instant invention is the impedance in the solid electrolyte batter is higher at a temperature between 100° C and 160 ° C than at room temperature. It is noted that both batteries shown in Pandalwar Fig. 5 have this characteristic. Thus, the battery using CELGARD 2300 separator exhibits this impedance property. Applicant asserts the battery disclosed by Pandalwar using CELGARD 2300 is a comparative example. This is unclear from the discussion in the Pandalwar patent, since the example is discussed as part of single Pandalwar "Example" and is not identified as a comparative example or prior art. However, even if the example with CELGARD 2300, is non-preferred, the example meets applicants' claims because the thickness and porosity of the commercially available CELGARD 2300 are inherent, and have been shown to meet applicants' claims.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not

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mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carol Chaney whose telephone number is (703) 305-3777. The examiner can normally be reached on Mon - Fri 8:00am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 703-308-2383. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



Carol Chaney
Primary Examiner
Art Unit 1745

cc
June 29, 2003